CERES Edition 3 Plans
Surface and Atmosphere Radiation Budget (SARB)
Default: Require CERES to reference Flash Flux

Clouds and the Earth’s Radiant Energy System (CERES)
Science Team Meeting at Hampton, Virginia (1-3 November 2005)

T. P. Charlock (NASA LaRC)
Fred G. Rose (AS&M) algorithm development
David A. Rutan (AS&M) CAVE validation
Zhonghai Jin (AS&M) coupled ocean atmosphere radiative transfer
Seiji Kato (H.U.) , Dave P. Kratz (LaRC) - modification of LaRC Fu-Liou code
Wenying Su (H.U.) - surface UV and PAR algorithms
D. Fillmore, W. Collins (NCAR), Greg Schuster (LaRC) - aerosol assimilation

Lisa H. Coleman, Thomas E. Caldwell, Scott Zentz (SAIC) - Data Management

www-cave.larc.nasa.gov/cave/ or google “CERES CAVE”
Clean-up IGBP map over coasts, elevation map USGS GTOP030

Advances to Fu-Liou code

Resolve SW band (0.7-1.3 µm)

Include variable GHC to SW (?)

Flux outputs written to archive:

Remove “non-CERES window” for 70 hPa, 200 hPa, 500 hPa and “no-aerosol”

Additional vertical levels (include untuned for NWP studies?)

Add a few SW spectral outputs at TOA only

FPAR in addition to current PAR (SYN)

Schuster help to Fillmore on next aerosol assimilation (internal mixture)

Add MODIS (GSFC) products to input stream for radiative transfer

Land spectral albedo - 16 day cycle (huge 1 km data set)

Daily 0.25 deg snow cover

Suggest cloud retrievals account for space-time variability of aerosols

CRS includes SW downwelling at TOA. Let it vary with solar cycle.
This is a CERES map of IGBP types near Tidewater, Virginia. A map with the degree scale is on the next page. The area within the magenta rectangle appears to contain 3 tiles (with each tile 10 minutes by 10 minute) of IGBP type 12 (cropland). **This wrecks CERES validation at COVE, which is the sole site with surface radiometers deployed over water.**

The magenta rectangle causes SARB to assign the wrong surface albedo for about half of the FOVs over COVE, making a mess of Terra CRS Edition 2B at the site. SARB has a surface albedo fix for a “validation subset re-run code”, but this does not help the Terra CRS Edition 2B archive. The Cloud WG has confirmed that the same rectangle botches their retrievals (the SARB subset re-run does NOT fix this). It’s possible that the magenta rectangle adversely affects the Inversion for TOA fluxes, too.
Difference between two elevation maps
This local bias in OLR (calculated-observed) is obtained every month. Elevation is the culprit.
CERES CRS: Surface and Atmosphere Radiation Budget (SARB) Product

Tuned fluxes at all 5 levels
All-sky & Clear-sky, Up & Down, SW and LW

Surface & TOA also have Untuned fluxes
Fluxes with aerosols
Pristine fluxes (no aerosols)

Aerosol forcing for all-sky & clear-sky

Tuning does NOT yield a perfect match to TOA observations.

Parameters adjusted when clear:
Skin temperature, aerosol AOT, precipitable water (PW)

Parameters adjusted when cloudy:
LWP/IWP, cloud top temperature, cloud fractional area within footprint
Dotted line: Upwelling LW at surface (calculated-observed)
Larger bias in SW at TOA (calculated - observed) where aerosols effects are ascribed to clouds.